

## A Review Paper On: Integrating Transparency and Security to Revolutionize Crowdfunding Using Blockchain Technology

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### Abstract

Crowdfunding has become a revolutionary way of raising funds by allowing people and organizations to raise funds from numerous supporters using web-based platforms. That aside, conventional crowdfunding platforms are typically beset with serious issues, such as poor transparency, security threats, and fraud threats that may ruin trust among funders and project developers. Blockchain provides a secure and decentralized way by capitalizing on its intrinsic properties like immutability, transparency, and smart contracts. Crowdfunding can be ensured to be secure, tracking of funds can be done in real time, and the project sponsors can be made more confident about the fundraising process by implementing blockchain technology. What has been provided here is some available literature on crowdfunding and applying blockchain technology in order to identify gaps in current crowdfunding platforms and where blockchain can offer cost-effective solutions. We quote past research with examples of fraud, misuse of funds, and no accountability in classical crowdfunding models. Together with that, we look into research works that exhibit how blockchain-based crowdfunding websites are able to ensure better security, fund transfers by smart contracts automatically, and maintain an open platform. By combining information from a variety of research pieces, we give a holistic overview of how blockchain will transform crowdfunding by developing a secure, trust-based, and decentralized platform for both funders and creators.

**Keywords:** Blockchain Technology, Crowdfunding, Transparency, Security, Smart Contracts, Fund Allocation.

### 1. Introduction

Blockchain technology is an innovative solution with the power to transform industries through increased transparency, security, and efficiency. It is widely used in conjunction with cryptocurrencies, yet it uses far surpass digital currencies, providing answers to basic problems in a multitude of industries. One of the areas that will greatly gain from Blockchain implementation is the industry of crowdfunding, which has traditionally been characterized by fraud, opaqueness, high fees paid to intermediaries, and inefficient allocation of funds. Centralized platforms

have conventionally worked in crowdfunding, and these centralized institutions manage the money flow, opening them up to mismanagement and diminishing trust among project creators and donors. Moreover, donors usually do not have an idea of how their money is being spent, and this is where the risk of fraud and misuse comes in. The above challenges act as a major entry barrier for project creators and potential supporters, which in the end discourages crowdfunding as a capital-raising option. In today's digital economy, an open

and secure crowdfunding model is critical to ensuring that fundraisers and donors trust each other. Conventional crowdfunding platforms rely heavily on third-party intermediaries to handle financial transactions, enforce agreements, and manage fund distribution. This centralization not only increases operational costs but also exposes transactions to potential manipulation and security breaches. Furthermore, high service fees imposed by these intermediaries often reduce the total amount of funds that actually reach project creators, making crowdfunding less efficient than it could be. Transparency over the fund distribution is another area of importance since most backers do not know what their funds are being spent on. With no trustworthy mechanism in place to trace the flow of funds, the risk of misuse increases, hence decreased confidence in the model of crowdfunding. [16] To overcome these drawbacks, our work proposes a new type of crowdfunding that uses Blockchain technology to implement a decentralized, secure, and trust-based fundraising mechanism. One of the biggest drawbacks of current crowdfunding sites is that there are no mechanisms to guarantee that money is spent as promised. Creators of projects can get funded but not deliver on their commitments, causing backers to be disillusioned. Also, the late disbursement of funds may pose operational challenges, particularly for projects that need constant funding in order to advance. Our Blockchain-based crowdfunding platform addresses these concerns by using smart contracts—autonomous contracts with agreed-upon conditions programmed into the Blockchain. These smart contracts allow funds to be disbursed only when conditions are fulfilled, like project milestones or agreed-upon deliverables. By streamlining the process of releasing funds, our method minimizes the risk of fraud considerably while giving assurance to backers that their funds will be utilized correctly. In addition to automating the release of funds, Blockchain technology increases accountability by keeping an unalterable and open ledger of all transactions. All transactions entered into the Blockchain are irreversible and cannot be modified, leaving a tamper-evident record of fund movement.

This function allows backers to know precisely where and how their money is utilized, fostering a greater sense of confidence in the platform. Furthermore, by abolishing third-party facilitators, Blockchain-based crowdfunding keeps operational costs low, which ensures that most of the amount of money collected actually goes toward creating the projects. This decentralization makes the fundraising accessible to everybody and everybody involved gets to benefit from a smoother, safer, and more open form of financing. Aside from increasing security and transparency, our suggested Blockchain-based crowdfunding platform promotes enhanced participation by building the trust of potential backers. Real-time tracking of fund utilization gives more people the incentive to support creative projects, resulting in healthier and more vibrant crowdfunding communities. Our system also accommodates global access so that supporters worldwide can contribute without limitations from conventional banking systems. With reduced fees, greater efficiency, and fraud-proof design, Blockchain-based crowdfunding is a revolutionary change that can empower creators while giving backers absolute confidence in the fundraising process. In summary, the conventional crowdfunding industry is confronted with a number of key challenges, such as transparency issues, security threats, high intermediary fees, and misappropriation of funds. Our Blockchain-based crowdfunding model offers an end-to-end solution by employing smart contracts to automate fund payment, increasing accountability with an unalterable transaction ledger, and doing away with the requirement for expensive third-party intermediaries. Through this novel approach, we hope to develop a safer, more efficient, and trust-based crowdfunding environment for both project starters and donors. With the development of Blockchain technology moving forward, the use of Blockchain in crowdfunding platforms can completely reshape the future of fundraising to become more accessible, trustworthy, and effective than ever. [21-23]

## 2. Literature Survey

This paper examines the application of blockchain

technology to crowdfunding platforms, highlighting its potential in promoting transparency, security, and financial inclusion. Existing crowdfunding models tend to be plagued by excessive transaction costs, distrust, and centralized authority. Blockchain, through its trustless and efficient decentralized ledger technology (DLT) and cryptographic security, presents a superior alternative. The research explains the advantages of blockchain crowdfunding, including the removal of intermediaries, secure transactions, and lowering operational expenses. The authors present case studies illustrating how blockchain crowdfunding facilitates peer-to-peer financial transactions, empowering MSMEs, startups, and social causes. Challenges like regulatory uncertainties, scalability, and adoption hurdles are also discussed. The paper suggests possible solutions, such as layer-2 scaling solutions and compliance models, to make blockchain crowdfunding more widely adopted around the world [1]. This paper explores the use of smart contracts in crowdfunding and their ability to automate fund transfers, minimize fraud threats, and cut out intermediary charges. In contrast to conventional crowdfunding platforms, whereby funds are handled by centralized intermediaries, smart contracts guarantee automatic disbursement of funds based on pre-agreed conditions and milestones of a project. The study goes into the technical architecture of smart contracts, how they utilize Ethereum's Solidity programming, consensus protocols, and self-executing contracts to design secure and impenetrable funding spaces. Security issues, including smart contract weaknesses, the risk of hacking, and regulatory compliance, are addressed. Secure coding practices, contract auditing methodologies, and decentralized dispute resolution are suggested by the authors to ensure these risks are minimized [2]. This article discusses the effect of blockchain crowdfunding on developing economies with regard to financial access for MSMEs and entrepreneurs who face challenges with conventional banking constraints. It emphasizes how blockchain platforms offer alternative funding avenues, allowing international participation without dependency on centralized entities. The research explains how blockchain's open, unalterable ledger encourages

investor trust, facilitating the raising of funds for startups. It also talks about regulatory issues, including jurisdictional disparities and compliance obligations, proposing solutions such as cross-border regulation frameworks and decentralized identity authentication. The authors find that blockchain crowdfunding can contribute enormously to financial inclusion and economic empowerment, especially in areas with less developed financial infrastructure [3]. This paper discusses how blockchain increases security in crowdfunding through the avoidance of scams, misappropriation of funds, and cyberattacks. The conventional crowdfunding websites are plagued by hacks, breaches of data, and lack of transparency in fund use, creating mistrust among investors. Blockchain's decentralized nature, encryption, and tamper-proof ledger guarantee that every transaction is made transparently, thus minimizing fraud risks. The research provides an overview of several security features such as multi-signature wallets, decentralized identity verification, and AI-based fraud detection algorithms, which can improve crowdfunding security. The paper also touches on actual fraud experiences in traditional crowdfunding and how blockchain solutions block these risks since they guarantee traceable and verifiable transactions of funds [4]. In this research article, the scalability issues of blockchain crowdfunding, especially in high-traffic fundraising situations, are discussed. With growing blockchain networks, they become slower in terms of transaction speed and have increased gas fees, affecting user experience. The research investigates several scalability solutions, including: Layer-2 scaling protocols (state channels, rollups) Sharding mechanisms for enhancing blockchain efficiency. Cross-chain interoperability for smooth crowdfunding across various blockchain networks. The authors examine Ethereum, Solana, and Polkadot and compare the scalability performance in crowdfunding applications. The paper states that scalable blockchain infrastructures play a key role in mainstream acceptance of blockchain-based fundraising models [5]. This paper is a case study of a crowdfunding platform built on top of blockchain, describing its

architecture, implementation, and user adoption. The research offers an overview of crowdfunding projects that have used blockchain technology in the real world and succeeded in raising funds in a transparent and secure manner. [17-19]

**The authors discuss:** Backend implementation in Ethereum smart contracts, User interface design to make the crowdfunding experience smooth. Issues with blockchain adoption and measures to boost user trust and engagement. The study highlights the potential of decentralized fundraising to surpass conventional models in cost-effectiveness, global access, and trust-based participation [6]. This article explores the use of blockchain crowdfunding for the education industry, allowing students and institutions to raise funds for educational projects. Conventional scholarship and funding channels tend to be bureaucratic, time-consuming, and narrow in scope. Through blockchain, educational crowdfunding sites can provide decentralized funding systems, enabling learners, scholars, and institutions to be funded directly by international contributors. Successful applications where blockchain-powered crowdfunding has made education resources more accessible, especially in disadvantaged areas, are noted in the research. It also touches on security issues, including scam campaigns and misallocation of contributions, and recommends smart contract-based verification systems for guaranteeing the use of funds for education [7]. This article presents a novel blockchain-based crowdfunding model that is scalable and secure. The authors suggest a hybrid solution that combines blockchain with AI-driven analytics to enhance fraud detection, contributor participation, and risk management.

**The main contributions of the research are:** Smart contract frameworks for automatic release of funds. AI-based investor profiling to match contributors with appropriate projects, Incorporation of decentralized identity verification to avoid fraudulent campaigns. The paper concludes that blockchain crowdfunding facilitated by AI can greatly enhance the efficiency of fundraising, minimize fraud, and boost investor confidence [8]. The study is on the application of real-time P2P transactions in blockchain-based crowdfunding. Unlike

crowdfunding platforms that use manual fund disbursement, blockchain facilitates immediate and automatic payment through smart contracts. The research explains how real-time transactions enhance liquidity, accelerate project funding, and minimize financial bottlenecks. It also identifies technical challenges, including network congestion and transaction finality, offering solutions like lightning networks and blockchain bridges to increase transaction speeds. The authors conclude that real-time blockchain crowdfunding has enormous potential to build an uninterrupted fundraising experience for both contributors and project creators [9]. In conclusion to the literature survey, blockchain transforms crowdfunding by enhancing transparency, reducing fraud, and lowering costs through decentralized ledgers and smart contracts. Key benefits include automated fund disbursement, financial inclusion, and global accessibility. Challenges like scalability and regulatory compliance persist, but advancements in AI-driven security and cross-chain interoperability can further refine blockchain-based crowdfunding for various sectors.[16]

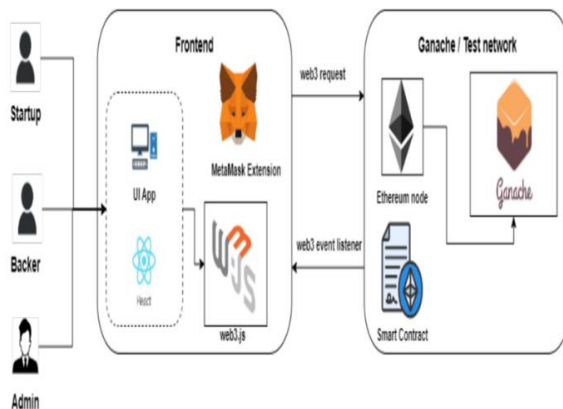
### 3. Methodology

This proposed system is a decentralized crowdfunding platform on blockchain technology to ensure transparency, security, and efficiency in fund-raising. The system follows a systematic development process through four significant phases:

- **Project Initiation & Planning:** Set goals, create a professional team, and develop a decentralized system architecture.
- **Project Execution:** Design smart contracts in Solidity to execute auto-fund transfers, implement React frontend for the UI, and deploy Ethereum blockchain for safe storage of data.
- **Control & Monitoring:** Perform security auditing, monitor the performance with the help of project management tools, and continually enhance scalability and adherence.

The system architecture of the system is as described and operates as illustrated below:





**Figure 1 System Architecture**

- **Actors:** Startups (fund-seeking), Backers (donors), and Admins (platform administrators). Figure 1 shows System Architecture.
- **Frontend:** A web interface based on React with MetaMask integration for wallet verification.
- **Blockchain Backend:** Ethereum smart contracts (tested with Ganache) to impose funding rules and keep immutable record-keeping. [10-15]
- **Interaction Flow:** Users connect wallets, initiate funding transactions, and transactions are executed through smart contracts, enabling automatic and secure release of funds. [20]
- **Security Controls:** Wallet-based authorization, role-based access, and tamper-evident on-chain data storage.

## Conclusion

Blockchain technology-based crowdfunding breaks the constraints of the old system by making fundraising secure, transparent, and efficient. Smart contracts and decentralization free it from intermediaries, lowering costs, and making sure money is spent on its intended purpose. The tamper-proof ledger makes it possible to track real-time, generating trust between creators and funders. By using a fraud-proof and clear platform, crowdfunding based on blockchain opens the doors to an open and trustworthy funding system, powering innovation and economic development.

## References

- [1]. Muneeza, A., Arshad, M., & Arifin, M. (2018). The application of blockchain technology in crowdfunding: Towards financial inclusion via technology.
- [2]. Gebert, M. (2017). Application of blockchain technology in crowdfunding - A case study of the EU.
- [3]. Saadat, H., Osman, N., & Zuhairi, R. (2019). Blockchain-based crowdfunding systems.
- [4]. Nguyen, H., Nguyen, T., & Nguyen, L. (2021). The role of blockchain technology-based social crowdfunding in advancing social value creation.
- [5]. Benila, S., Ajay, V., Hrishikesh, K., & Karthick, K. (2019). Crowd funding using blockchain.
- [6]. Felipe, I. J. dos S., Mendes-Da-Silva, W., & Gattaz, C. C. (2017). Crowdfunding research agenda.
- [7]. Shelke, P., Zanjali, S., Patil, R., Desai, D., Chavan, H., & Kulkarni, P. (2024). Crowdfunding using smart contracts.
- [8]. Bernardino, S. Santos. (2020). Crowdfunding: An exploratory study on knowledge, benefits, and barriers perceived by young potential entrepreneurs.
- [9]. Fletcher Fernandes, Harsh Gharat, Anuj Kadam, Amaan Kamil, Crowd Funding Platform Using Blockchain, International Journal of Innovative Research in Technology (IJIRT), Volume 9 Issue 10, March 2023.
- [10]. Abhinav R.B, Basavesh M, Ahmed Mohtesham, Farhan Ashraf, Akash, Literature Survey on "Crowdfunding Using Blockchain", International Research Journal of Engineering and Technology (IRJET), Volume 10 Issue 2, February 2023.
- [11]. Vipul Gupta, Tushar Goel, Ajay Pratap Singh, MR. Vivek Kumar, Blockchain-Based Crowdfunding Platform, Tuijin Jishu/Journal of Propulsion Technology, Vol. 45 No. 2, 2024.

- [12]. Pragati Mahale, Pranit Morab, Unlocking Financial Innovation: A Deep Dive into Blockchain-based Crowdfunding, International Journal of Global Sustainable Research (IJGSR), Vol.1, No.2, 2023.
- [13]. Karamjeet Kaur, Tushar Khati, Sushil Kumar, Sumit Singh Negi, Rahul Kumar, Blockchain-Based Crowdfunding for Education, YMER, Volume 23 Issue 02, February 2024.
- [14]. Sushanth Kumar Reddy Kura, Trupthi M, Crowdfunding Using Blockchain, International Journal of Computer Applications, Vol. 185, No. 10, May 2023.
- [15]. S.S. Sambare, Kalyani Khandait, Kshitij Kolage, Tanvi Nimbalkar, Keyur Kolambe, Crowdfunding using Blockchain for Startup Ventures, International Journal of Computer Applications (IJCA), Volume 185 No. 10, May 2023.
- [16]. Firmansyah Ashari, Tetuko Catonsukmoro, Wilyu Mahendra Bad, Sfenranto, Gunawan Wang, Smart Contract and Blockchain for Crowdfunding Platform, International Journal of Advanced Trends in Computer Science and Engineering (IJATCSE), Volume 9, No.3, May - June 2020.
- [17]. Atluri Divija Choudary, Role of Blockchain Technology in Crowdfunding, International Banking and Finance, Symbiosis Law School, Hyderabad, Symbiosis International (Deemed) University, Pune.
- [18]. Ashrit Chattani, Akash Sharma, Adwin Manhar, Research Paper on "Crowdfunding using Blockchain", Journal of Emerging Technologies and Innovative Research (JETIR), Volume 10, Issue 6, June 2023.
- [19]. Aby Varghese, Nandhana A Regi, Sandhu Babu, Shalini Mani, Chitra Merin Varghese, Crowdfunding Platform Using Blockchain, International Research Journal of Modernization in Engineering Technology and Science (IRJMETs), Volume 5, Issue 5, May 2023.
- [20]. Priyanka Gupta, Vedika Sangle, Rutuja Patil, Anjali Jadhav, Mayuri Aher, Shruti Khivansara, Secure Way of Crowdfunding using Blockchain, International Journal of Research Publication and Reviews (IJRPR), Volume 5, Issue 5, May 2024.
- [21]. D. L. Falak, Soudagar Shanawaz, Jadhav Pranav, Katke Kajal, Shukla Utkarsh, Crowd-Funding Using Blockchain Technology, International Journal of Research Publication and Reviews (IJRPR), Volume 3, Issue 11, November 2022.
- [22]. B. Chakradhar, V. Hari Sai Vinathi, S. Girish Kumar, S. Nikhil, V. Pooja Pravallika, Y. Deepika, Crowdfunding using Blockchain Technology, International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), Volume 3, Issue 5, April 2023.
- [23]. Md Nazmus Saadat, Syed Abdul Halim, Husna Osman, Rasheed Mohammad Nassr, Megat F. Zuhairi, Blockchain-based Crowdfunding Systems, Indonesian Journal of Electrical Engineering and Computer Science, Vol. 15, No. 1, July 2019, pp. 409-413.